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ABSTRACT

Problems associated with overspecialization in U.S. higher education are considered, based on the view that colleges provide training for an advanced society but fail to clarify how a particular career will be part of a larger social and global system that has many serious problems. An education that seeks to integrate ideas across disciplinary lines is advocated. Education should relate what is learned in general education to what is studied in the student's major field, and should seek to develop a breadth of knowledge in students. Differences among interdisciplinarity, multidisciplinarity, and transdisciplinarity are addressed. Interdisciplinary programs are cited that have either a pragmatic, theoretical, or humanistic origin. These include: the Humanities Perspectives on the Professions program at the University of Florida, Gainesville; the Program for Integrative Education at Earlham College, Indiana the Interdisciplinary Studies Program at the College of the Holy Cross in Massachusetts, and the Federated Learning Communities model at the State University of New York at Stony Brook. Use of transdisciplinary concepts at the University of Wisconsin at Green Bay and Empire State College in New York City is discussed, and two colleges are cited where general education is studied in the senior year. (SW)

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INTERDISCIPLINARITY:

Education for Social Consciousness

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"The penetrating and disquieting argument of student activists, that university reform inherently implies reform of our society cannot be denied . . . no other institution is equally well qualified and legitimized." (Jantsch 1970, p. 101)

"widespread education is the only effective instrument for bringing about social and political reforms. . . . our vast array of knowledge needs to be reexamined, reworked and recast to suit the intellectual, social and ethical needs of our time." (McGrath 1978, p. 8)

"The problems and issues of a modern society overbound the traditional confines of self-contained schools of thought and, therefore, can best be analyzed from an interdisciplinary perspective" (Catalogue of the University of Houston at Clear Lake 1977, p. 1)

"a decision to engage in armed confrontation and a decision to employ nuclear weapons are human acts . . . hard science and technology contribute little to our understanding of how to anticipate or prevent such acts. For such understanding we must turn to psychology, sociology, history, political science, anthropology, education and related fields" (Astin 1985, p. 222)

"interdisciplinarity is understood to mean interaction among two or more disciplines and should include the idea of integration of concepts . . . interdisciplinary programs have the potential for promoting change within the institution and society" (Mayville 1978, p. 2)

Introduction

If I could view the world and its many institutions as an independent and impartial observer, well-removed from the biases and blinders which society has equipped me with, I might conclude that we are, most of us, mad, foolish or at least wholeheartedly ignorant. Since I cannot become this detached person, ranting and raving about the obvious like the future historians no doubt will do and in a way that will shame us all, I will have to be content to make my critique as the fully active participant in society that I am.

As I view the world around me, what is most troubling to stomach is the fact that so much more in known than is applied. While we have amassed tremendous knowledge (millions of books have been written in our language alone), the most pressing problems such as over-population, famine, environmental destruction, resource depletion and the arms race still persist with their solutions as evasive as ever.

In this paper I will suggest one possible cause of the present impasse, namely the inability of most people to see a relationship between how they live their lives and the condition of the world in which they live. I will further suggest that much of this blindness can be attributed to our present system of higher education in which individuals become highly knowledgeable about a specific area, but have little or no understanding of how their career will relate to the larger social and global picture. I will conclude that an educational system which encourages students to integrate areas of knowledge and achieve breadth of understanding will produce a greater number of people consciously

seeking to pursue careers aimed at improving the condition of society.

From Cells to Society

There is an analogy that I find helpful in illustrating the points I will be trying to make, namely that individuals relate to society much like cells to an organism. Just as individual cells live, reproduce and die generation after generation in the life cycle of one organism, so too do individual people live for just a fraction of the life span of most societies. The role of both people and cells can be seen as taking one of two possible courses: living solely for one's own survival versus living for the survival of both one's self and one's society/organism. All people and all cells strive foremost to survive. In a healthy organism, most all cells also work for the healthy functioning and survival of the whole. However, there are times when certain cells are only interested in self-preservation and thereby threaten the survival of the organism. Cancer cells for example, work to survive and reproduce themselves and yet are unaware of the damage done to the whole. When death then comes to the organism, it does not discriminate, it takes all the cells with it, cancerous or not.

In a society where people do not understand their role as part of the functioning whole, their actions of self-preservation will often be damaging to the healthy functioning of the whole. When such naivete becomes the norm, society becomes gravely ill. In this sense, our society has become diseased. For too long, a majority of individuals have pursued their own self-preservation

without evaluating their actions as integral to the makeup of society as a whole. Our society suffers from neglect by its members. The consequences are evident in the way we treat each other, and in the way nations treat other nations.

The Ills of Overspecialization

How might education serve to perpetuate this problem? How might it act as a vehicle for overcoming this problem?

Education plays a very big role in shaping society. I would guess that over 90% of all the professionals and leaders in this country have spent at least a couple of years in an American college or university. Most have received graduate or professional degrees and have therefore spent from five to ten years in academic institutions. Universities are therefore one of the major actors in shaping the "pillars" of society.

Though there is tremendous variety across the spectrum of universities, there are also many important similarities in the way education in structured. Almost all students go through a similar ritual: For the first and second years they take area requirements combined with some electives. Before the end of the second year they are required to choose a major area for study which involves a number of required courses for the remaining two years, complimented by electives and/or remaining area requirements. In graduate schools, students become literate in the terms and techniques of a particular area within the gamut of human knowledge. They become highly qualified to serve the segments of society which demand specific knowledge and skills. Schools produce the hardware for a growing industrial society

and, in turn, society places tremendous pressure on schools to provide it with more trained personnel.

> "Society demands of institutions above all, <u>training</u> . In an increasingly mobile and specialized society, training becomes the primary tool for economic and social advancement. . . An imperative for efficiency thereby reaches back from society into academic structures." (Swoboda, p.79).

In the meantime, the area requirements, or General Education as they are more commonly known, tend to be viewed by students as less meaningful, for they do not land one a job.

> "Entering freshman have a great difficulty in perceiving any proprietory interest in learning beyond the diploma or major that will render them employable" (Adelman, p. 15).

As our society has advanced technologically and economically, the work of specialists has become highly valued, and as an avenue for wealth and prestige, it has plenty of lanes for traffic. In and of itself, this is does not pose a problem. The danger comes through neglect of the problems associated with growing technology and with unchecked economic progress, a neglect which often takes its toll on other segments of society or other populations of the world. Names like "industrial pollution", "runaway technology" and "runaway inflation" are problems associated with rapid and unchecked growth.

Most citizens seem wholly unprepared in today's complicated world to understand the roll which government plays in the regulation (or lack thereof) of this growth and its byproducts.

Although one of the chief responsibilities of government has traditionally been to protect people through laws which regulate industry and the economy, over the last couple of decades government has been able to relinquish much of this responsibility to

other agencies, often in response to the demands powerful interest groups who feel that government control constitutes "meddling", and is therefore undemocratic. As a consequence, we not only have the problems associated with rapid growth and expansion, we are becoming ever more likely to suffer from the unpleasant side-effects of such growth.

While our educational system provides society with a vehicle for growth through trained specialists, it fails to emphasize the need to produce the necessary road signs to guide that vehicle in its course, namely an informed and responsible citizenry.

According to former U.S. Senator Charles Mathias, "in the past, two imperatives shaped our system of higher education - the need for an educated citizenry capable of informed decisions necessary to the success of representative government, and the need for national growth through innovation." (Mayville, p. 17). Whereas the innovation imperative may be linked to specialized training and disciplinary research (something still very much a priority in higher education), the educated citizenry imperative seems to refer to the goals of General or Liberal Education. While training is the vehicle for growth, General Education essentially guarantees that such growth will be responsibly guided and regulated by an informed society. In the situation in which our country finds itself in today, with fewer than 30% of the voting population able to elect the president, we are clearly witnessing the absence of an informed citizenry necessary to the success of representative government.

I believe that an educational system such as ours, which has

several years to educate our country's leaders and professionals as well as many of citizens in non-professional jobs, must be held accountable for much of the ignorance and apathy in so many of its students and graduates.

General Education: The Forgotten Imperative

According to Clifford Adelman, it is through the requirement of General/Liberal Education courses that students are "expected to acquire a breadth of knowledge . . . (to) develop both the critical, reflective capacities that liberate the mind and the awareness of self and sensitivities to the lives of others that free the soul". (Adelman 1984, p. 29). It seems that the purpose of General Education may have been traditionally to develop within students the "educated citizenry" imperative of Senator Mathias'.

For the most part, today's General Education is given summary treatment in curricular planning. With few exceptions there are rarely efforts to meaningfully relate what is learned in General Education with what is being studied for one's major. It is as if "breadth of knowledge" and "specialization" were incompatible concepts when in fact it is only through a breadth of knowledge that specialized skill can be responsibly applied.

The dichotomy between General Education and the specialized orientation of the disciplines has become ever more pronounced over the years. The possibility that students will see connections between concepts is becoming more and more unlikely, especially as the knowledge which the disciplines impart seems to have less relationship to the broad goals and orientation of the

General Education courses.

> "The growth of a discipline does not necessarily bring with it an extension of its field of inquiry. Indeed, an inverse relationship seems to hold here, insofar as the realm of any discipline seems to become narrowed by its progressive internal fission into specialties and subspecialties which attempt to legitimize their activities by emphasizing the differences that separate them from each other rather than the similarities that relate them" (Swoboda 1979, p. 64).

The present structure of higher education, which supports greater specialization with less effort towards creating this "educated citizenry" imperative, may well be perpetuating many of the problems in todays society.

Confronting the Problem through Innovative Programs

In response to what has been called an overspecialization in higher education, there have been many efforts to develop more integrative programs. These efforts, which aim to facilitate the development of a breadth of knowledge in students, usually approach the problem from an interdisciplinary perspective. That is, through the development of programs which seek to show the inter-relationship between different disciplines.

The impetus for the establishment of such programs seems to come from a variety of sources. In an effort to better understand the nature of these programs and the role they may play in addressing the problems of overspecialization, inadequate General Education, uniformed citizens, and in short, social ills, I will attempt to classify these programs by their origin and structure. By origin I refer to the impetus for the creation of a particular program, i.e. what led to its development. With regard to structure, I will attempt classify the approach taken to imparting

knowledge in an interdisciplinary fashion, discussing similarities and differences among programs.

It seems that the impetus to develop an interdisciplinary program comes from one of three sources. I will call these the pragmatic, the theoretical and the humanistic origin for the development of interdisciplinary programs. Most of the programs that were reviewed fit into one these three categories of origin. I will discuss each of these in turn, citing specific examples of programs which fall into each of these categories.

Pragmatic Origin

During a 1982 panel discussion sponsored by the National Commission on Excellence in Higher Education, representatives from major employers expressed the need "for a greater emphasis in undergraduate education on programs and strategies designed to develop generic capacities, not technical skills" (Adelman, p. 23). Programs of pragmatic origin include those which derive out of pressures from institutions of a non-academic or graduate/professional orientation, i.e. from sources beyond of the undergraduate institution -- sources which have expressed the need for more well-rounded or broadly trained personnel. Such programs usually target students in pre-professional tracks and seek to broaden their understanding of human problems and relations in order to make them more productive and/or effective in the workplace.

One notable example of such a program is the "Humanities Perspectives on the Professions" program at the University of Florida in Gainesville. This program was the brainchild of the

Medical School which was "becoming increasingly disturbed at the quality of education of their first year students." (Carson 1978, p. 40). Special interdisciplinary courses were offered to seniors in premed, prelaw, and prebusiness tracks. The courses - designed to "inculcate preprofessional students with the values and attitudes that only a study of humanities can bring" - were team taught by professors from the humanities and the professional schools and included titles like "Humanities Issues in Engineering". Though not systematically evaluated, both the faculty and the students completed written evaluations for the courses and gave them very high ratings.

It is interesting to add that the problems associated with underpreparation among professionals has been a target of similar programs in other countries as well. At the Indian Institute of Technology in Dehli India for example, students are given training in the development of human values and cooperative social skills in the belief that "it is essential for the satisfactory progress of his work that an engineer get along well with all people." (Wey, 1976 p. 70).

Theoretical Origin

The majority of interdisciplinary programs seem to be born of theoretical origin. That is, based on the theory that the most fulfilling educational experience is one which allows students to develop a kind of holistic understanding, or which involves the development of synthetic, integrative thinking skills. The immediate impetus for the establishment of such programs is to provide a more ideal education and to produce more

personally satisfied students. While the above mentioned programs of pragmatic origin most often stem from the practical needs of businesses and professions, programs of theoretical origin are born of the affective needs of individual students as perceived by a particular educational institution or program designer.

One such a program was instituted at Earlham College in Indiana. The Program for Integrative Education (PIE) at Earlham describes itself to students as a way for them "to find unity" in their education. One course entitled "Discovery and Interpretation: the History and Philosophy of Chemistry and Physics" was team taught by four faculty representing each of the disciplines listed in the course title. The class met for 10 hours every week for an entire year and covered material equivalent to an entire course in each field. The program received very positive student evaluations (Bakker 1978, p. 44).

A program at College of the Holy Cross in Massachusetts entitled "The Interdisciplinary Studies Program" (ISP), sought to "develop students' analytic and synthetic thinking skills." The program offered sequences (combinations of 2 or more courses taken during the same time period) designed to "integrate with and reinforce each other." One such sequence entitled "Economics, Values and the Human Condition" combined courses in history, economics, religious studies and biology. Following an extensive assessment, the evaluators concluded that,

> " the actual experience of having to integrate two or more disciplines at the same time . . . brings about greater cognitive growth than does studying the same material in separate courses without the consciously designed integrative rubric" (Adelman, p. 31).

The programs at both Earlham College and College of the Holy Cross, were founded on the belief that the ability to organize and synthesize material should be an integral part of the educational experience for all students.

Humanistic Origin

Whereas courses of pragmatic origin may be seen as fulfilling a social need for more well-rounded professionals, and programs of theoretical origin as fulfilling individual needs for an integrative educational experience, courses of humanistic origin are born of a desire to improve society through providing students with an interdisciplinary education that addresses social and global problems and the avenues for overcoming such problems.

> "America needs minds that have the skills of relating one thing to another, of seeing connections. . . There is a compelling need to develop the syndetic courses and exercises that force students to look for connections - connections between the runoff of farm fertilizers and the death of Lake Erie; . . . connections between drought in the Middle West, Soviet economic priorities and starvation in India; connections between gadgetry and pollution; connections between prejudice and domestic crime." (Bailey 1977, p. 38).

At the University of Wisconsin-Green Bay, the curriculum is structured in an effort to illustrate these connections for students. The interdisciplinary program at Green Bay involves "problem-centered units called 'concentrations' . . . organized around basic long term issues." (Sheppard 1978, p.30). These concentrations, such as "Science and Environmental Change", and "Human Development" serve as majors for students and departments for faculty. The entire program aims to pro-

vide students with training in careers that will promote a more healthy global environment.

A similar program at the State University of New York (SUNY) at Stony Brook was introduced during the early seventies as a self-study project. A group of faculty from several disciplines offered a set of courses which addressed a particular theme such as "World Hunger". The courses were team taught bytwo or more faculty and served to fulfill the students' General Education requirement. Together the faculty and students formed what were called "Federated Learning Communities" (FLC's). Participating students, evaluated on a number of outcome measures, showed significant cognitive and affective growth. There was also a measurable increase in the professional aspirations of the faculty who participated in the study. The FLC model was subsequently adapted "at a variety of institutions" (Adelman, p.3e).

Other Factors Leading to Interdisciplinarity

The programs discussed above, whether of pragmatic, theoretical or humanistic origin, all involve efforts to integrate knowledge in an interdisciplinary fashion as a means to confront the problems they see in overspecialization. While many interdisciplinary programs are therefore the result of these three sources of impetuses, there have been other influences within education which have contributed to the presence of interdisciplinary programs. As student enrollments have declined, some departments have found it necessary to offer courses which appeal to students from other disciplines in order to survive. This has

led to the teaching of courses that contain material from a variety of disciplines. Similarly, the closing of academic departments has resulted in a shuffling of faculty into other departments, leading to greater mixing of ideas within departments, something which lends itself to the establishment of interdisciplinary programs.

Interdisciplinarity, Multidisciplinarity and Transdisciplinarity

Although most programs which seeking to cross disciplinary lines, use the term "interdisciplinary", there is rarely an explanation given of what is meant by this term. This most likely stems from an unfamiliarity among program designers, with the extensive literature available on the theory of interdisciplinarity, and on the related theories of multidisciplinarity and transdisciplinarity.

According to Jean Piaget, multidisciplinarity is said to "occur when the solution to a problem makes it necessary to obtain information from two or more sciences or sectors of knowledge without the disciplines drawn on thereby being changed or enriched" (Piaget 1972, p. 136). This has also been called "cross-disciplinarity" (Mayville 1978, p.17), and tends to imply that there is little integration or interrelating among the ideas being taught. Richard Meeth, in his article "Interdisciplinary Studies: A Matter of Definition", tells us that in multidisciplinary programs, it is the students who are required to "do the integrating" (1978 p. 10). Many programs which call themselves interdisciplinary, but which are comprised solely of a group of courses in different disciplines, centered around a common theme,

are in fact multidisciplinary.

True interdisciplinarity occurs when there is an effort to achieve an integration of ideas, an interrelatedness of concepts. Piaget states that interdisciplinarity occurs when the cooperation between disciplines leads "to a certain reciprocity of exchanges resulting in mutual enrichment" for the disciplines involved in the interdisciplinary effort (p. 17). Interdisciplinary programs are those in which faculty members from different disciplines either team teach a single course together, or teach independant courses in a series with close collaboration in the form of note-sharing, attendance in one another's sessions, and group planning on decisions regarding materials used in the series.

Transdisciplinarity is perhaps the most esoteric of the various approaches towards the idea of integration across disciplines. Beyond simply promoting an integration of ideas, transdisciplinarity places the interactions between disciplines "within a total system without any firm boundaries between (them)" (Piaget p. 15). Richard Meeth goes a step further by telling us that,

> "transdisciplinarity means beyond the disciplines. Whereas interdisciplinary programs start with the discipline, transdisciplinary programs **start with the issue or problem** and, through the process of problem solving, bring to bear the knowledge of those disciplines that contributes to a solution or resolution." (1978, p. 10, emphasis added).

Transdisciplinarity, therefore, does not begin by teaching the student the ideas and methods of a discipline followed by a review of the problems which the discipline examines, rather it begins with a problem and requires the student (and/or professor)

to call upon whatever disciplines become appropriate during the process of problem solving.

Meeth goes on to say that "transdisciplinary programs are certainly the most difficult to teach . . . consequently few institutions attempt transdisciplinary study, even though it is the most common approach to the major issues that confront society" (p. 10).

"Transdisciplinary" Programs

None of the 30 interdisciplinary programs which I reviewed made mention of the term "transdisciplinary", however the three theoreticians who discuss the concept seem to agree that it represents the highest level of integrated study (Meeth 1978, Piaget 1972, Jantsch 1972). If this is in fact the case, it seems that either the program designers have not examined the work of the theoreticians and are thus unfamiliar with transdisciplinary concepts, or that such concepts are too difficult to implement. I would suggest that the absence of any mention of transdisciplinarity in the program literature reflects a combination of both these problems.

It is important to point out however, that while perhaps none of the programs consciously utilized transdisciplinary concepts, a handful of them included the most important components of transdisciplinary theory in their program design. At the University of Wisconsin at Green Bay for example, we are told that "students first select a problem, then try to solve it through studies is several concentrations." (Sheppard 1978, p. 32). As discussed earlier, concentrations at the University of Wisconsin

at Green Bay are problem-centered units such as "Human Development". Students select a problem of interest to them within one of these units and, through the process of problem solving, draw upon other units or concentrations. The approach in largely transdisciplinary in that the learning process begins with a problem identified by the learner which is then pursued in a way that subsequently draws on the work of various disciplines.

Another example of the use of transdisciplinary concepts can be found at Empire State College in New York City. The expressed goal of the university is to provide a liberal arts education, but to make all learning approaches student centered. To meet this goal, a student's advisor will consider past achievements of the student's, as equally important in planning a particular set of courses, as any time-honored curricular approaches that other institutions might rely on exclusively. (Hall 1986, p. 2).

In his discussion of the Empire State approach to student learning, James Hall notes one particular case of a student who entered the university with an established career in textile weaving. The student wanted to study weaving and yet further her education in the liberal arts. At Empire State she was encouraged to begin by pursuing her interest in weaving from as many angles as she could. She ended up studying about Medieval tapestries, therapeutic uses of weaving, the physical structure of natural and synthetic fibres, the historical use of steam engines and water wheels to power looms, and the philosophy of aesthetics. In short, her interest in weaving brought her into studies of art, history, psychology, chemistry, physics, sociology, and philosophy. She was able to begin with a problem, namely her

insufficient understanding of weaving in the broad social context, and pursue the problem through extensive readings which in turn, brought her into contact with many disciplines. Thus she not only learned a lot about weaving, she also received a strong liberal arts education in the meantime.

At both Empire State College and the University of Wisconsin, the programs begin with a problem perceived directly by the student, thereby establishing within the student an inherent interest in the educational process of problem solving, through the personal relationship they have to the problem.

> "passivity and indifference are the consequence of presenting answers to unasked questions and solutions to problems not yet perceived by the student." (McCoy, 1985, p. 5).

By beginning with a problem, identified by the student, transdisciplinarity replaces passivity and indifference with involvement and excitement.

Transdisciplinary Concepts and General Education

Within transdisciplinary theory there seems to be the position that most problems and interests, if pursued sufficiently, will naturally cross many disciplinary lines. If this is in fact the case, it could have important implications for the present structure of higher education. Perhaps most significantly for the position of General Education in the undergraduate setting.

The stated purpose of General Education is for students to acquire a breadth of knowledge. The usual approach requires a student to take courses from several different disciplines such as art, science, and humanities. General Education courses are

usually taken during a students first two years so that the last two years can be reserved for the study of the student's chosen discipline. If however, the pursuit of a problem of special interest can lead one into several disciplines, which seems to be a significant possibility according to transdisciplinary theory, then it might be more constructive to place General Education in the senior year, as the natural extension of one's studies in a concentration. Such a model would require that students identify a problem area within their discipline, and pursue its solution until they had delved sufficiently into other disciplines so as to fulfull the requirements of General Education. Surely such an approach to developing breadth of knowledge would involve greater interest and participation by the student, given his relationship to the problem which he would be studying.

Several schools have already experimented with what might be termed the General Education-specialization reversal.

At Mount Ida College's Bachelor of Liberal Learning Studies Program, "the senior year carries the major burden of this task of harmonizing career interests and interdisciplinary Liberal Studies, thus inverting the traditional sequence of General Education." (Adelman, p.33).

At Lynchburg College in Virginia, there is team taught Senior Symposium which serves to fulfill the student's General Education requirement. The program is founded on the belief that when majors are chosen after General Education completion, the two cannot be meaningfully related.

Neither the program at Mount Ida nor Lynchburg were care-

fully evaluated, but given what we know about the difficulty students have in relating the knowledge of the specialized disciplines with the material in the General Education courses, we would expect that such programs might very well lend themselves to a greater integration of concepts by the students.

Natural Barriers to Interdisciplinarity

While we can appreciate the benefits of inter- and transdisciplinary programs, there are many obstacles to the movement towards integrating knowledge in this way.

For the most part, the disciplines have their feet firmly planted. Many faculty feel that instruction in interdisciplinary courses is a "distraction from specialization, research and writing." (Carnegie Commission, 1977, p. 183). Such an attitude reflects the underemphasis placed on undergraduate teaching in general. (It is often difficult enough to have a faculty member teach courses within his own discipline much less courses which include material from other fields). Indeed, faculty members are probably the main obstacle to efforts seeking greater interdisciplinarity.

It seems therefore, that the future of interdisciplinary programs may rest entirely on the "ability and willingness of faculty members to move outside of their usual intellectual, professional and social orbits." (Gaff and Wilson 1970, p. 186). It is a bold and daring step, but for the few faculty who have done so, the results suggest that they too can benefit, together with their students. Seeing connections, learning to develop an integrated vision or a holistic understanding of concepts across

disciplinary lines, is surely an intellectually and emotionally gratifying experience.

Concluding Remarks

In this paper I have discussed what I perceive to be the problems associated with overspecialization in American higher education. While universities provide the training required of an advanced and advancing society such as ours, they fail to adaquately show students how a particular career will be part of a larger social and global system, a system which has many very serious problems.

When I talk about the products of overspecialization, I am not speaking merely about electrical engineers inventing fuses at Hughes Aircraft, or biologists creating pathogens for germ warfare, I am speaking also about psychologists who study helping behavior, or anthropologists who study tribal aggression and yet make no effort to explain to their students or to the lay person how their discoveries can help us to understand and improve the world. And I am also talking about people who have been to college and who have supposedly acquired a breadth of knowledge through the General Education courses, and yet who are too apathetic or uninformed even to vote.

Overspecialization produces a lot of people who do a lot for their own well-being and yet fail to ask themselves if what they do contributes to the world's problems, or to the problems' solutions. All action is part of the whole. Nothing anyone does is inert or neutral.

An education which seeks to integrate ideas across discipli-

nary lines, represents a beginning to the establishment of greater social awareness and a healthier society. It is only through the ability to see connections, that people will work to align themselves with the efforts to solve problems ratherthan with the ignorance that creates and perpetuates them. Education has a tremendous responsibility in this regard, to strive to create an environment where ideas are not thrown at students with no sensitivity as to the relatedness of things. As the famous educator Alfred Whitehead once said, education is more than "a process of packing articles in a truck". Indeed, it is a process of understanding truth as it is revealed through the knowledge found in the disciplines. And surely truth is not confined to any one of those discipline.

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